

EXHIBIT #4 for Modification of License WF2XCV

submitted by ARTEMIS, INC. File # 0027-EX-ML-2013

NECESSARY BANDWIDTH DESCRIPTION

SlimSAR Bandwidth Requirements

The range resolution of a SAR image is inversely proportional to the bandwidth of the transmitted signal. In order to obtain a finer resolution in the processed SAR image, it is necessary to increase the bandwidth of the transmitted signal. This is accomplished by ramping the “chirp” (described in Exhibit #3 – MODULATING SIGNAL DESCRIPTION) over a wider range of frequencies.

SlimSAR is designed such that the bandwidth of the transmitted signal may be set prior to operation. For testing purposes, we use the smallest reasonable transmitted bandwidth in order to minimize possible interference with other devices. For the low-power testing phase, a bandwidth of 700 MHz is requested which results in a resolution of 21.5 cm/px. Fine-resolution SAR imagery is useful for identifying and classifying potential targets in the imaged scene. The primary purpose of the high-power search mode is to locate large, bright targets in a scene. The resolution, and thus bandwidth, requirements for this mode are less stringent and we have requested 200 MHz for a resolution of 75 cm/px. The SlimSAR is capable of forming a transmit signal with an arbitrary bandwidth up to 700 MHz, and ARTEMIS' policy is to transmit the narrowest bandwidth which will support necessary testing.